

## CLAIMS

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A.1  
We claim:

1. A method of producing in a solid transparent material, a hologram of an object, comprising the steps of:

developing a three-dimensional mathematical model of an electro-magnetic field emanating from said object, said field producing an image of said object;

computing a corresponding three-dimensional set of points, light scattered from which reconstructs said field; and

focusing a pulsed laser beam into said solid transparent material onto each of said points sequentially, said beam being capable, when focused, of causing optical breakdown damage in said solid transparent material.

2. The method of claim 1 and wherein said object is a real object.

3. The method of claim 1 and wherein said object is a virtual object.

4. The method of any of claims 1 to 3 and also including the step of arranging said set of points as a set of diffraction lattices.

5. The method of claim 4 and wherein said set of diffraction lattices are such that light diffracted therefrom forms a three-dimensional colored image.

6. The method of claim 4 and wherein said set of diffraction lattices are such that light diffracted therefrom forms a stereo image.

7. The method of claim 4 and wherein said set of diffraction lattices are such that light diffracted therefrom forms an image capable of being viewed from a plurality of angles.

WO 01/14937

PCT/IL00/00481

8. The ~~method~~ of claim 1 and wherein said set of points are arranged as a holographic optical element.